

Hydrostratigraphy-Key to Cost-Effective Ground Water Cleanup at Lawrence Livermore National Laboratory

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ABSTRACT

Rapid, cost-effective cleanup of ground water requires a thorough understanding of the hydrogeologic factors that control the site-specific flow and transport of contaminants in the subsurface. At Lawrence Livermore National Laboratory (LLNL), we have used the concept of hydrostratigraphy to characterize the site and are improving the positioning of pump-and-treat extraction wells and piezometers for optimal contaminant mass removal and hydraulic control of individual plumes.

Hydrostratigraphic characterization also allows for clearer presentation of important information such as, contaminant migration pathways, individual plume geometries, and hydraulic capture areas for ground water cleanup to DOE, regulators, and the community.

LLNL is underlain by multiple plumes, consisting predominantly of volatile organic compounds (VOCs) that are distributed within a 200 to 300-ft sequence of heterogeneous alluvial sediments. Seven hydrostratigraphic units (HSUs) have been defined using lithologic descriptions, geophysical logs, contaminant distributions, aquifer tests, and water levels. Cross sections and maps of plume distribution, water levels, and the geometry of the high-permeability pathways were made for each HSU.

* Richard Blake will be presenter.

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Understanding the hydrostratigraphy at LLNL has allowed us to reduce the number of extraction wells and piezometers originally planned for the ground water cleanup and provides a sound technical basis for planning priorities, resulting in long-term cost savings.

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